An International Journal
JSCDSS
http://www.jscdss.com
Vol.4 No.3 June 2017: 21-26
Article history:
Accepted 29 June 2017
Published online 29 June 2017

Journal of Soft Computing and Decision Support Systems

E-ISSN: 2289-8603

Web Service Composition Based on Qualitative Parameters Using Top-K Color Classification

Elahe Hajaliasghar Ajil Frosh [a], Sima Emadi [b]
[a] Department of Computer Engineering, Yazd Branch, Islamic Azad University, Yazd, Iran
[b] Department of Computer Engineering, Yazd Branch, Islamic Azad University, Yazd, Iran

*** Corresponding author email address**: emadi@iauyazd.ac.ir

Abstract

Service-oriented architecture is the key to run web services. It has been a promising solution for composing services. Given the increase and complexity of the users' needs, atomic services will not be adequate in service-oriented systems. Thus, drawing on the ability to compose services, scholars are searching for an optimal composition with identical efficiency among web services. Of course, service composition involves attention to the users' needs and adapting them to qualitative parameters as the non-performance requirements of the system during the composition. The composition of automatic services will be a useful technology in composing multiple atomic services; however, the present attempts do not bring about the favourable efficacy. Many methods have been proposed by the researchers for composition of automatic services. However, in this paper an effort has been made to ameliorate the defects by introducing changes in Top-K algorithm. In the proposed method, the concept of 'color' has been employed in the section dealing with service composition in order to discard the backtracking technique in Top-K algorithm and the objective is to increase efficacy in composing web services and improve the time in the execution of the composition process. The proposed method improves the rate and accuracy of algorithm execution by displaying the services using graphs and the implemented color. Compared to the existing methods, the evaluation of the recommended method indicates a drop in memory usage, an increase in the speed of algorithm execution and the achievement of optimal results in less time.

Keywords: Web service composition, Classification algorithm, Parallelization, Top-K algorithm

1. Introduction

A great deal of attention has been focused on service-orientation with regard to the capacity of being used in various places independently of any particular technology on a large scale by viewing the user's varying needs (Liangzhao et al., 2006).

In some cases, as the atomic service is not efficient in responding to the user and the user's needs are not met, composing atomic services and arriving at an optimal service composition that has the quality that the user requires are prominent issues in service-orientation (Liangzhao et al., 2006). Given the cases that were mentioned, the objective in automatic service composition is to provide new value-added services from the ones that exist, thus leading to more efficient user services (Liangzhao, et al., 2006). To select from a large number of services, there are various methods at the level of web compositions and an optimal composition can be provided considering qualitative parameters which indicate the survey of services (Liangzhao, et al., 2006). If several different services are available to achieve a certain goal, the user can make a choice depending on his or her demand to select the best composition which is possible.

In sum, an increase in the number of services, the existence of a bottleneck and scalability are among the serious challenges that should be regarded in service compositions. Despite other methods, the recommended method allows the users to access diverse compositions to meet their preferences. Therefore, if an optimal composition is invalid, another composition can be chosen as an alternative. Having access to additional compositions is very effective at the time the algorithm is being executed in that the user will not need to apply the algorithm once again to find a new composition. Top-K algorithm increases the consumable memory due to the application of the backtracking technique in finding the courses.

Wei et al. (2014), proposed a method by applying the genetic algorithm to select the best service while composing the service from similar ones with regard to the applicable programming and all accessible qualitative parameters. The best service composition based on applicable programming and high scalability can be mentioned as the advantages of this method. One of the weaknesses of this method is the absence of parallelization technique similar to Top-K in the process of composition which leads to a faster composition.